recall of normal patients. The clinical decision—that is, the action recommended when reporting on the photograph—even though some detail may not have been recorded, agreed with direct assessment by the ophthalmologist in 96·5% of cases. Studies using fundus photography (mydriasis and seven stereophotographs for each eye) have shown this to be more accurate than ophthalmologists in detecting diabetic retinopathy.[13] Thus the false negative rate may have been higher, but as seven field mydriatic fundus photography is not suitable for screening the ophthalmologist was used for comparison.

An important aspect of screening for diabetic retinopathy is the sensitivity to proliferative retinopathy. The determined sensitivity of non-mydriatic fundus photography is better than that reported for diabetologists.[8] In addition, of the 11 cases of proliferative retinopathy identified by the ophthalmologist, two were overlooked by the observers reporting on the photographic appearance because they were distracted by a coexisting maculopathy. When these photographs were re-examined at the end of the study the neovascularisaton was clearly seen; thus this was an error of reporting and not of photographic recording.

This study did not show any definite advantage of either Polaroid or transparencies for recording. We believe, however, that transparencies record more detail. In addition, the ease of projection with magnification for reporting, lower cost, and ease of storage increase our preference for the use of transparencies.

The cost effectiveness of screening for diabetic retinopathy has already clearly been shown.[5] Non-mydriatic photography provides an effective screening method that is cheap and easy to use. Mass screening for diabetic eye disease is not at present widely available. Future changes in medical education may, hopefully, improve the screening by non-specialist medical staff. The doctor in this study has an interest in diabetes, routinely uses mydriasis, and has previously attended diabetic eye clinics. His excellent rate of detection was far higher than that reported for general doctors.[8] Screening using ophthalmic opticians has been suggested,[14] but this has been criticised as expensive and their accuracy has not been assessed fully.[15,16] There are insufficient ophthalmologists to screen all diabetics, but indirect screening using photographs may be feasible.

We consider non-mydriatic retinal photography to be an effective method of screening for diabetic eye disease. The provision of a photographic service in a general diabetic clinic, or in the community, with later interpretation of the photographs (preferably by the ophthalmologist who would be called on to administer treatment) is an accurate and cost effective method of screening for diabetic retinopathy. Further studies are required to confirm this.

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SHORT REPORTS

Acute renal failure after overdose of labetalol

Renal failure after overdose of β blockers or labetalol has not been reported, despite usually severe and prolonged hypotension. We describe a patient who developed acute oliguric renal failure after a massive overdose of labetalol.

Case report

A 19 year old previously healthy woman was admitted one hour after attempting to commit suicide by ingesting 16 g labetalol. She did not take any drugs regularly, and her blood pressure was usually 120/60 mm Hg. On admission she was alert with a blood pressure of 80/60 mm Hg and pulse of 76 beats/min. Further physical examination yielded unremarkable results. Despite infusion of 250 ml plasma her blood pressure fell to 70/50 mm Hg 20 minutes after her admission but 10 minutes later rose to 85/60 mm Hg after infusion of another 250 ml plasma. Gastric lavage was performed and activated charcoal administered. Another 500 ml plasma and dopamine 2 μg/kg/min were given to maintain systolic blood pressure above 100 mm Hg. No rhythm or conduction disturbances occurred apart from transient first degree atrioventricular block. The serum labetalol concentration was 2850 μg/l on admission (concentrations above 500 μg/l are toxic) and fell to 60 μg/l the next day. Toxicological screening indicated that she had not taken any other drugs.

Urine output was 25 ml in the first hours after admission and failed to increase despite continued infusion of dopamine 2 μg/kg/min and the administration of frusemide 40 mg five hours after admission. While blood pressure was 130/70 mm Hg a Swan-Ganz catheter was inserted; central venous pressure of 6 mm Hg, cardiac output of 9 l/min, and systemic vascular resistance of 74·5 kPa.s/l (745 dyn.s/cm^5) were recorded. Oliguria persisted, with a maximum urine output of 420 ml on the fifth day after ingestion. Serum urea concentration rose from 3·4 mmol/l (20 mg/100 ml) on admission to 28·0 mmol/l (168 mg/100 ml) five days later, and serum creatinine concentration rose from 113 μmol/l (1·3 mg/100 ml) to 1144 μmol/l (12·9 mg/100 ml). Urinary sodium concentration was 10 mmol(mEq)/l and urea concentration 4 mmol/l (24 mg/100 ml) in a urine sample obtained the morning after admission. No rash or eosinophilia developed, and no myoglobinuria was found. A renal biopsy three days after ingestion showed mild local tubular necrosis and no abnormalities in glomeruli or interstitium. Haemodialysis was performed on the sixth hospital day and repeated twice afterwards.

On the 10th day urine output increased again and renal function recovered rapidly: serum urea concentration fell to 6·4 mmol/l (38 mg/100 ml) on the 23rd day, when she was discharged, and was 3·8 mmol/l (23 mg/100 ml) four months later; serum creatinine concentration was 113 and 74 μmol/l (1·3 and 0·8 mg/100 ml), respectively. Renal function studies showed a glomerular filtration rate of 19 ml/min 15 days after ingestion and 102 ml/min four months later, effective renal plasma flow rising from 169 to 480 ml/min. The filtration fraction rose from 0·11 to 0·21.

Comment

It is remarkable that despite usually severe and prolonged hypotension acute renal failure after an overdose of a β blocker has not been reported.[1] In our patient acute oliguric renal failure developed after a short period of moderate hypotension. Causes such as myoglobinuria and interstitial nephritis were excluded. The tubular necrosis and initially low filtration

fraction are compatible with so called vasomotor nephropathy as the cause of renal failure.[2] Perhaps the differences in renal haemodynamic properties between β blockers and the α and β blocker labetalol lead more readily to acute renal failure after an overdose of labetalol. Hypotension leading to acute oliguric renal failure is accompanied by intense preglomerular vasoconstriction, which makes filtration highly dependent on an adequately maintained postglomerular resistance.[2] In therapeutic doses labetalol leads to a fall in renal vascular resistance; this is in contrast with most β blockers, which cause an increase.[3,4] A fall in postglomerular resistance induced by labetalol, perhaps enhanced by the renal vasodilating effects of dopamine in the dose used in our patient, may have been responsible for the failure of filtration.[5]

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Endoscopic removal of pharmacobezoar of slow release theophylline

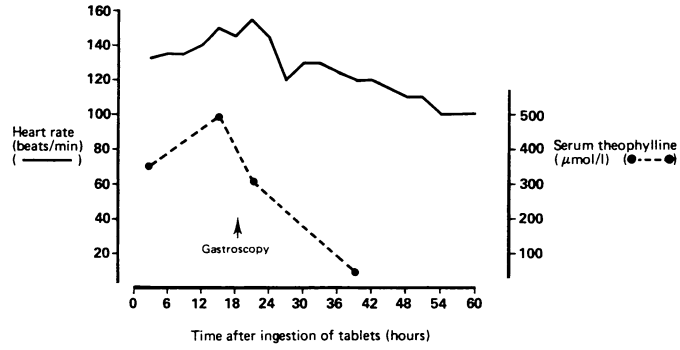
Overdose with slow release theophylline preparations can result in sustained toxic serum concentrations and is therefore associated with appreciable morbidity and mortality. We report a case of such an overdose in which absorption of the drug and systemic toxicity were further prolonged by aggregation of tablets in the stomach.

Case report

An 18 year old woman presented to the casualty department having taken about 60 of her mother's 300 mg slow release theophylline tablets (Theo-Dur, Fisons UK Ltd) two to three hours previously. On examination she was flushed, tremulous, and agitated but fully conscious. Electrocardiographic monitoring showed a sustained sinus tachycardia of 132 beats/min. Hypokalaemia was noted, the serum potassium concentration being 2·5 mmol(mEq)/l. The serum theophylline concentration was 350 μmol/l (63 mg/l) (therapeutic range 55-110 μmol/l; (10-20 mg/l)). Gastric lavage with a wide bore tube failed to yield any tablet particles. Activated charcoal (50 g) was then administered orally. Physiological saline and potassium chloride were infused intravenously at rates of 100 ml/h and 7 mmol(mEq)/h, respectively. Over the next 12 hours she became more agitated and tremulous, her heart rate increased to 150-160 beats/min, and she developed persistent vomiting. The theophylline concentration 12 hours after admission had risen to 490 μmol/l (88 mg/l). Gastroscopy with a GIFQ endoscope (Key Med Instruments, Southend on Sea), was carried out under diazepam sedation and showed a white, friable bolus of congealed tablets 2 cm in diameter lying on the greater curvature of the stomach. This was grasped in a Dormia basket and removed. The stomach was then irrigated by water jet and all visible tablet particles aspirated. After endoscopy 20 g mannitol in 2 litres of water was administered orally over two hours. Three hours after endoscopy the theophylline concentration had fallen to 312 μmol/l (56 mg/l). Over the next 12 hours her symptoms abated and both heart rate (figure) and serum potassium concentration returned to normal. She remained free of symptoms thereafter.

Comment

Overdose with any preparation containing theophylline may not only result in distressing vomiting, tremor, and agitation but cause profound hypokalaemia, generalised convulsions, and serious cardiac arrhythmias, mortality as high as 50% being reported.[1] Delayed absorption from slow release preparations will prolong and may postpone toxic effects; absorption of Theo-Dur, for example, continues for up to 24 hours after ingestion.[2] Perhaps as a consequence of the resultant prolonged exposure to the β



Heart rate and serum theophylline concentration before and after gastroscopic removal of tablet bezoar.
Conversion: SI to traditional units—Serum theophylline: 1 μmol/l≈0·18 mg/l.

stimulant effects of theophylline a fatal outcome has been reported after ingestion of as little as 6 g of the slow release preparation. An intragastric aggregation of tablets, with consequent gradual leaching of active drug from the "bezoar," as described in this case, may further delay absorption and prolong the duration of toxicity.

The formation of similar intragastric concretions or bezoars has been reported after ingestion of meprobamate and aluminium hydroxide in large quantities, as in overdose.[3-5] In such circumstances gastric lavage, even if performed soon after ingestion of the drug, as in this case, will prove ineffective in removing the drug from the stomach. The rapid fall in theophylline concentration and heart rate seen in this case after endoscopic removal of the tablet bolus suggests that this manoeuvre was highly effective in preventing further absorption of the drug, for otherwise the serum theophylline concentration would have continued to rise for at least a further 12 hours. We therefore propose that endoscopy should be considered in cases of overdose of slow release theophylline in which clinical signs and serial theophylline concentrations suggest continuing drug absorption.

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Imaging in rheumatoid arthritis using liposomes labelled with technetium

Liposomes are small microscopic spheres composed of one or more concentric phospholipid bilayers.[1] After intravenous injection they are taken up by the cells of the reticuloendothelial system and are found mainly in the Kupffer cells of the liver and the macrophages of the bone marrow and spleen. As the synovial tissue of patients with rheumatoid arthritis is rich in phagocytic cells we undertook a preliminary study to determine whether radiolabelled liposomes would identify joints affected by rheumatoid disease.

Patients, methods, and results

We studied two control subjects and eight patients with rheumatoid arthritis (six with active and two with inactive disease). Patients with active disease had